

# SAP Business Intelligence Reporting

## BEx Ad Hoc Query Fundamentals - Part III

Washington State HRMS Business Intelligence (BI)  
BI Power User Workshop Materials

General Topics - BI Power Users

# BEx Ad Hoc Query Fundamentals - Part III

The following BEx Ad Hoc Query Fundamentals - Part III section provides an overview of BEx Ad Hoc Query Fundamentals and builds on the key terms and concepts covered in BEx Query Fundamentals - Part I and Part II.

Business Intelligence Release 1

BI Release 1 Security

BI Release 1 Environment

Business Explorer (BEx)

What is BEx?

BEx Tools Overview

BEx Query Designer

BEx Query Analyzer

BEx Ad Hoc Query Fundamentals Part III Overview

Compound Characteristics

Hierarchy Characteristics

Hierarchy Characteristic Properties

Hierarchy Variables

Basic Formulas

Ad Hoc Query Dates

Key Date

# BEx Ad Hoc Query Fundamentals - Part III Overview

BEx Ad Hoc Query Fundamentals - Part III contains the following key terms and concepts:

- Compound Characteristics
- Hierarchy Characteristics
- Hierarchy Characteristic Properties
- Hierarchy Variables
- Basic Formulas
- Ad Hoc Query Dates
- Key Date

The screenshot displays the BEx Query Designer window titled "Query: New Query". The interface includes a menu bar (Query, Edit, View, Tools, Help) and a toolbar with various icons. The main workspace is divided into several panels:

- InfoProvider:** Shows a tree structure under "Headcount and Personnel Administration". The "Time" dimension is expanded, showing "Cal. Year/Quarter", "Calendar Day", "Calendar month", "Calendar Year", "Calendar Year/Month", "Quarter", and "Unit". A bracket on the left groups the "Time" dimension and its sub-items, with a callout box labeled "Ad Hoc Query Dates".
- Filter:** Contains a "Characteristic Restriction" section with "Personnel Area". Below it is a large area labeled "Area for Filter Values".
- Default Values:** Lists "Ethnic Origin", "Organizational Unit", "Pay Scale Group", "Pay Scale Type", "Pay Scale Area", and "ES Grouping for CAP". A callout box labeled "Hierarchy Variable" points to "Organizational Unit".
- Rows/Columns:**
  - Free Characteristics:** Contains "Ethnic Origin".
  - Columns:** Contains "Key Figures" with sub-items "Number of Employees", "Number of Female Employees", and "Avg Number of Female Employees". A callout box labeled "Basic Formula" points to this section with the text "choose one or more objects of the same type."
  - Rows:** Contains "Organizational Unit", "Pay Scale Group", "Pay Scale Type", "Pay Scale Area", and "ES Grouping for CAP". A callout box labeled "Hierarchy Characteristic" points to "Organizational Unit".
  - Compound Characteristics:** A callout box labeled "Compound Characteristics" points to the "Rows" section.
- Properties:** A panel on the right with a "General" tab. It contains the text "No properties available for the current selection." and a callout box labeled "Key Date is set in the Properties Pane".
- Preview:** Shows a table with columns "a-Organizat", "a-Pay Scale", and "a-Pay Scale".
- Messages:** A status bar at the bottom shows "0 Messages".

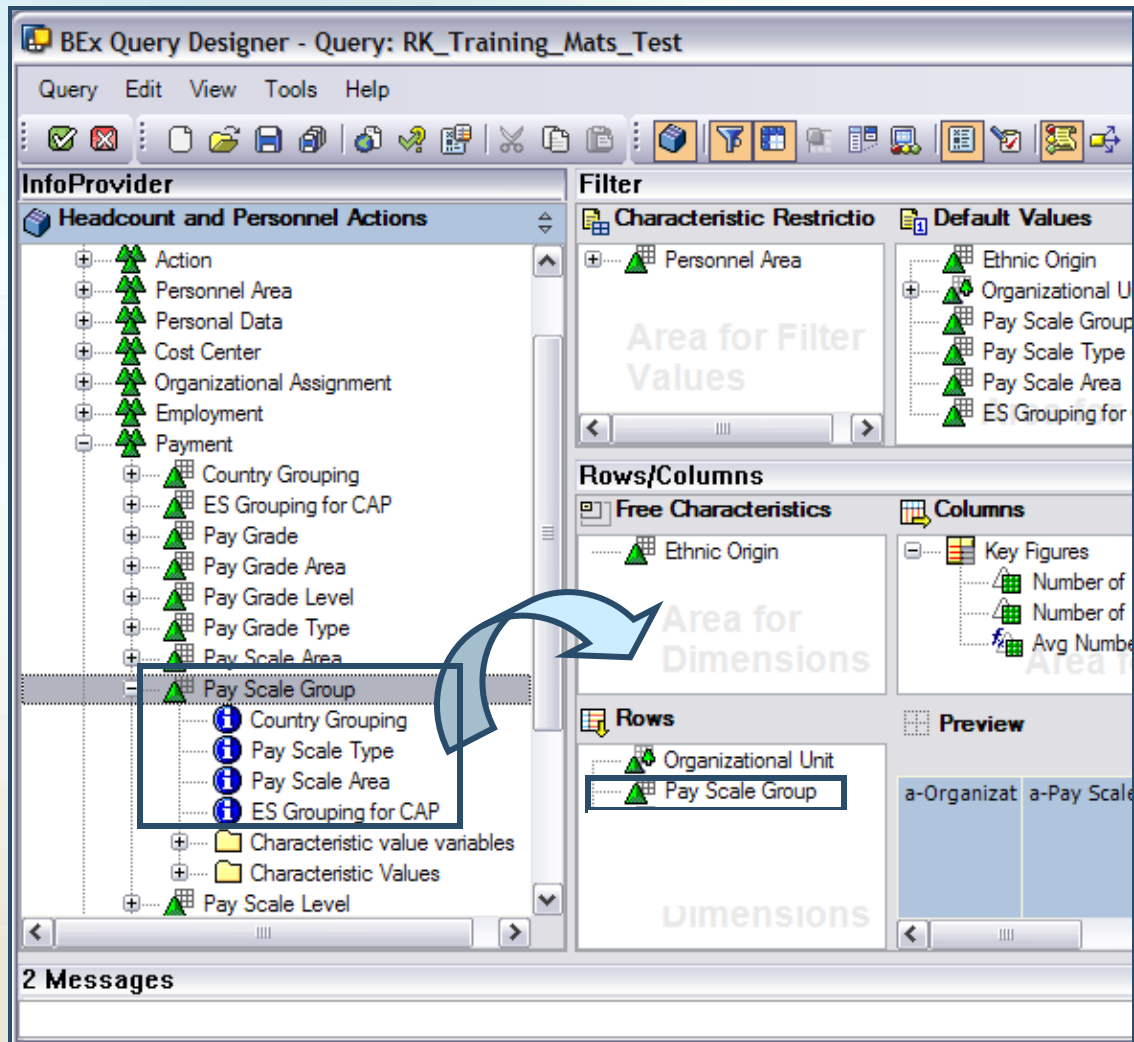
# Compound Characteristics

**Compound Characteristics** are part of a group of Characteristics that are dependent on one another.

For example, the Pay Scale Group Characteristic is a Compound Characteristic that is compounded with the following Characteristics:

- Country Grouping
- Pay Scale Area
- Pay Scale Type
- ES Grouping for CAP (Employee Subgroup Grouping for Collective Agreement Provisions)

If Pay Scale Group is added to the query, all of its related Characteristics listed above are automatically included in the report results.



Continued...

# Compound Characteristics, Cont...

In the example below, the Pay Scale Group Characteristic has been added to the ad hoc query. Country Grouping, Pay Scale Type, Pay Scale Area and ES Grouping for CAP are automatically added to the report results since they are Compounded with Pay Scale Group.

- To remove the Compound Characteristic data from the report, right click on “Pay Scale Group”, select “Properties” → “Characteristic”.
- In the Properties box, click on the “Display” dropdown arrow and select on that says “Not Compounded). This will remove the data for the Compound Characteristic from the results.

The screenshot shows the HR system interface with the following components:

- RK\_Training\_Mats\_Test** window:
  - Display As:** Table
  - Columns:** Key Figures
  - Rows:** Organizational Unit, Pay Scale Group, Pay Scale Type, Pay Scale Area, ES Grouping for CAP
  - Pay Scale Group** is highlighted in the Rows list.
- Properties of Characteristic Pay Scale Group (Result Set Context)** dialog box:
  - General** tab is selected.
  - Display:** Key (Not Compounded)
  - Display Results:** Always
  - Access Mode for Result Set:** Posted Values
  - OK** and **Cancel** buttons are at the bottom.
- Pay Scale Group without Compound Characteristics** window:
  - Shows a list of Pay Scale Group values: #, #, #, 21, 22, 25, 27.
- Context Menu:** A right-click context menu is open over the Pay Scale Group column, showing options like Back, Filter, Change Drilldown, Broadcast and Export, Save View, Personalize Web Application, Properties, Documents, Sort Pay Scale Group, and Axis. The **Properties** option is selected.

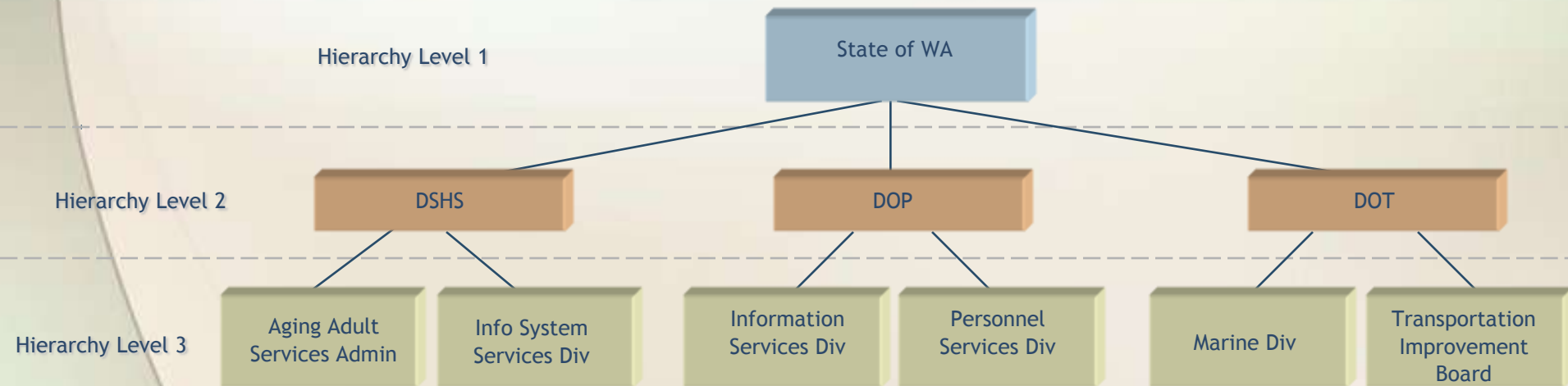


**Hierarchy Characteristics** are Characteristics arranged in a tree structure. In BI Release 1, the only hierarchy is the Organizational Unit Hierarchy.

The Organizational Unit Hierarchy allows the user to select a “parent” Organizational Unit (such as State of WA or DOP in the example below) and include all the “child” Organizational Units that are beneath it when the ad hoc query is run.

The example below represents the Organizational Unit Hierarchy structure with each box representing a different Organizational Unit. These Organizational Units are arranged hierarchically with the State of Washington being the highest level, and Agencies below.

## Sample Organizational Unit Hierarchy Structure

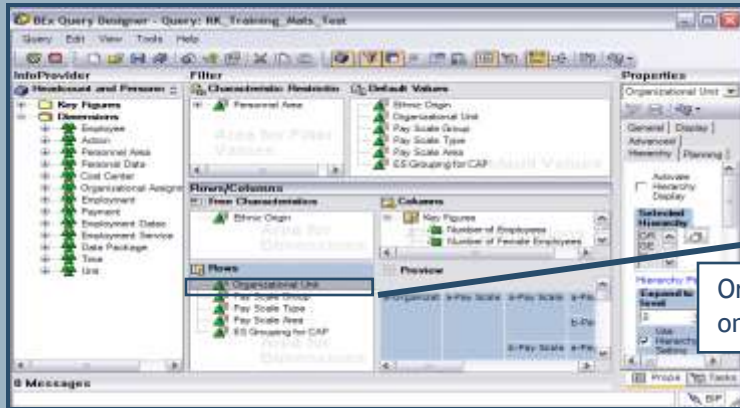


Continued...

# Hierarchy Characteristics, Cont...

The example below shows the difference between using the Organizational Unit Characteristic and the Organizational Unit Characteristic with the Hierarchy in the ad hoc query (see Variables for information on adding the Organizational Unit Hierarchy Variable).

Organizational Unit in Query (w/out Hierarchy)

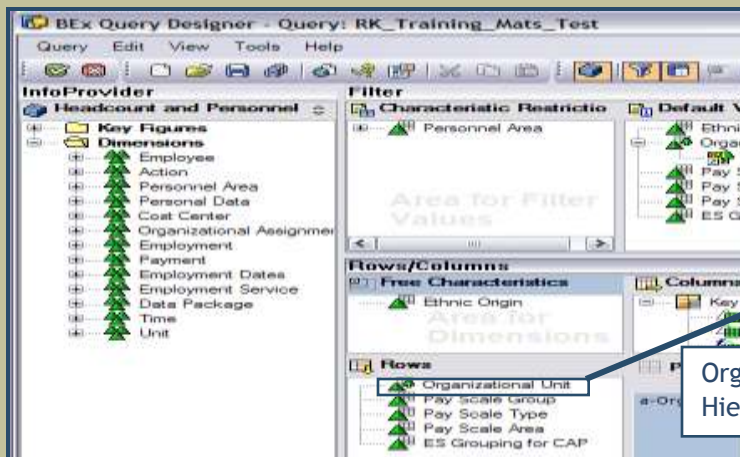


Query Results for Organizational Unit (w/out Hierarchy)

Organizational Unit	Pay Scale Group	Pay Scale Type	Pay Scale Area
30000510	10/00/01/3/58	10/00	Non-Represented
30000515	10/00/01/3/66	10/00	Non-Represented
DA	10/##/##/##	10/##	10/Not assigned
	10/##/##/3/##	10/##	10/Not assigned
	10/00/01/1/44	10/00	Non-Represented
	10/00/01/1/48	10/00	Non-Represented
	10/00/01/1/50	10/00	Non-Represented
	10/00/01/1/54	10/00	Non-Represented

Organizational Unit only

Organizational Unit Hierarchy in Query



Query Results for Organizational Unit Hierarchy

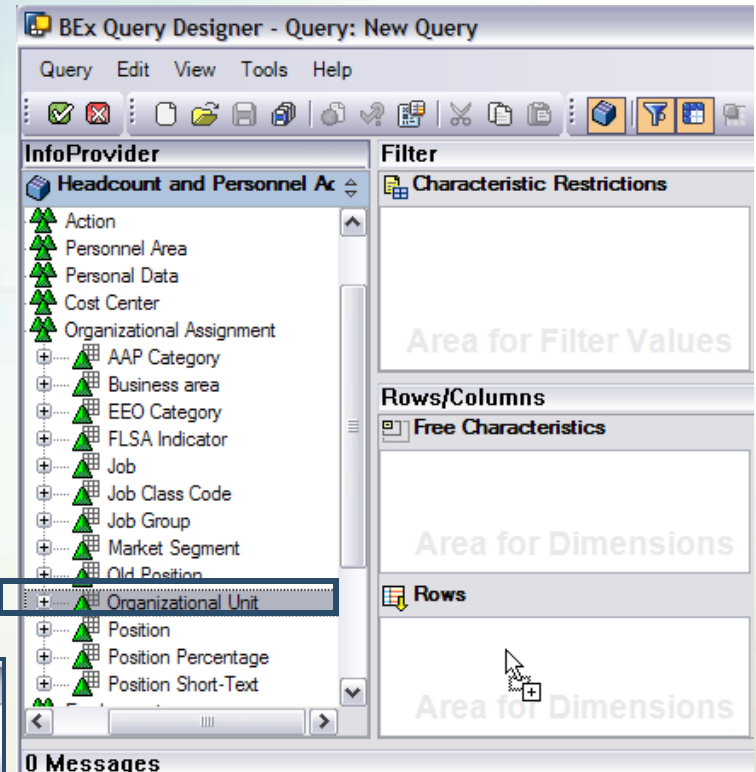
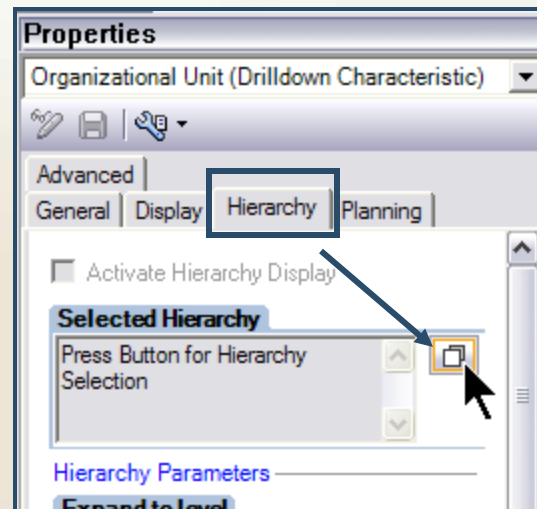
Organizational Unit	Pay Scale Group	Pay Scale Type	Pay Scale Area
▼ SOW	10/00/01/3/55	10/00	Non-Represented
	10/00/01/3/56	10/00	Non-Represented
	10/00/01/3/58	10/00	Non-Represented
	10/00/01/3/62	10/00	Non-Represented
	10/00/01/3/66	10/00	Non-Represented
	10/00/01/3/70	10/00	Non-Represented
	10/00/07/3/27G	10/00	Non-Represented
	10/00/07/3/35G	10/00	Non-Represented
	10/00/07/3/41G	10/00	Non-Represented
	10/01/01/3/58	10/01	WFSE
► 111	10/##/##/##	10/##	10/Not assigned
	10/##/##/1/##	10/##	10/Not assigned

Organizational Unit Hierarchy

# Hierarchy Characteristics, Cont...

To make the Organizational Unit Characteristic a Hierarchy:

1. Drag&Drop the Organizational Unit Characteristic from the Organizational Assignment Dimension to the Rows section of the query.
2. From the Properties pane for Organizational Unit, select the Hierarchy tab and click the matchcode button.

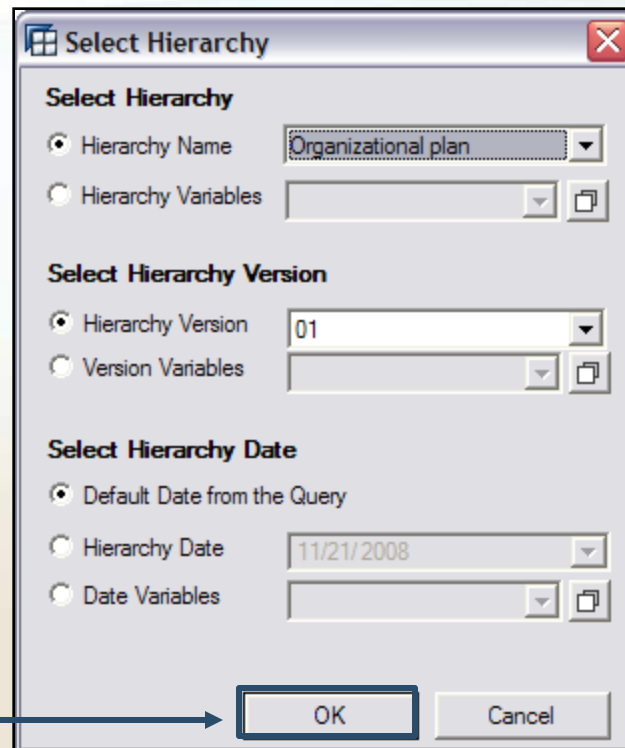




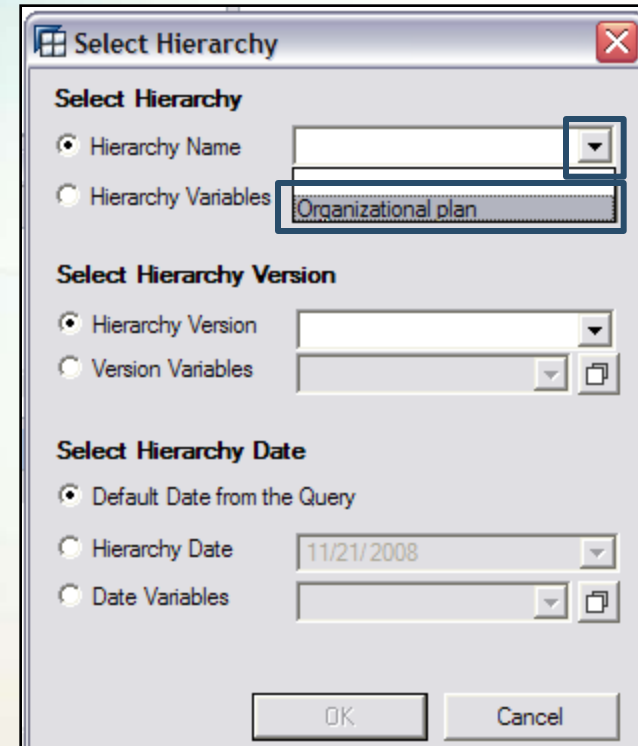
# Hierarchy Characteristics, Cont...

To make the Organizational Unit Characteristic a Hierarchy:

3. Click on the dropdown in the Hierarchy Name text box and select the Hierarchy (there is only one).
4. Version and Date have default values. These can be left as default.
5. Click OK.



The screenshot shows the 'Select Hierarchy' dialog box. The 'Hierarchy Name' dropdown is set to 'Organizational plan'. The 'Hierarchy Version' dropdown is set to '01'. The 'Hierarchy Date' dropdown is set to '11/21/2008'. The 'OK' button is highlighted with a blue box, and an arrow points to it from the instruction 'Click OK.'.

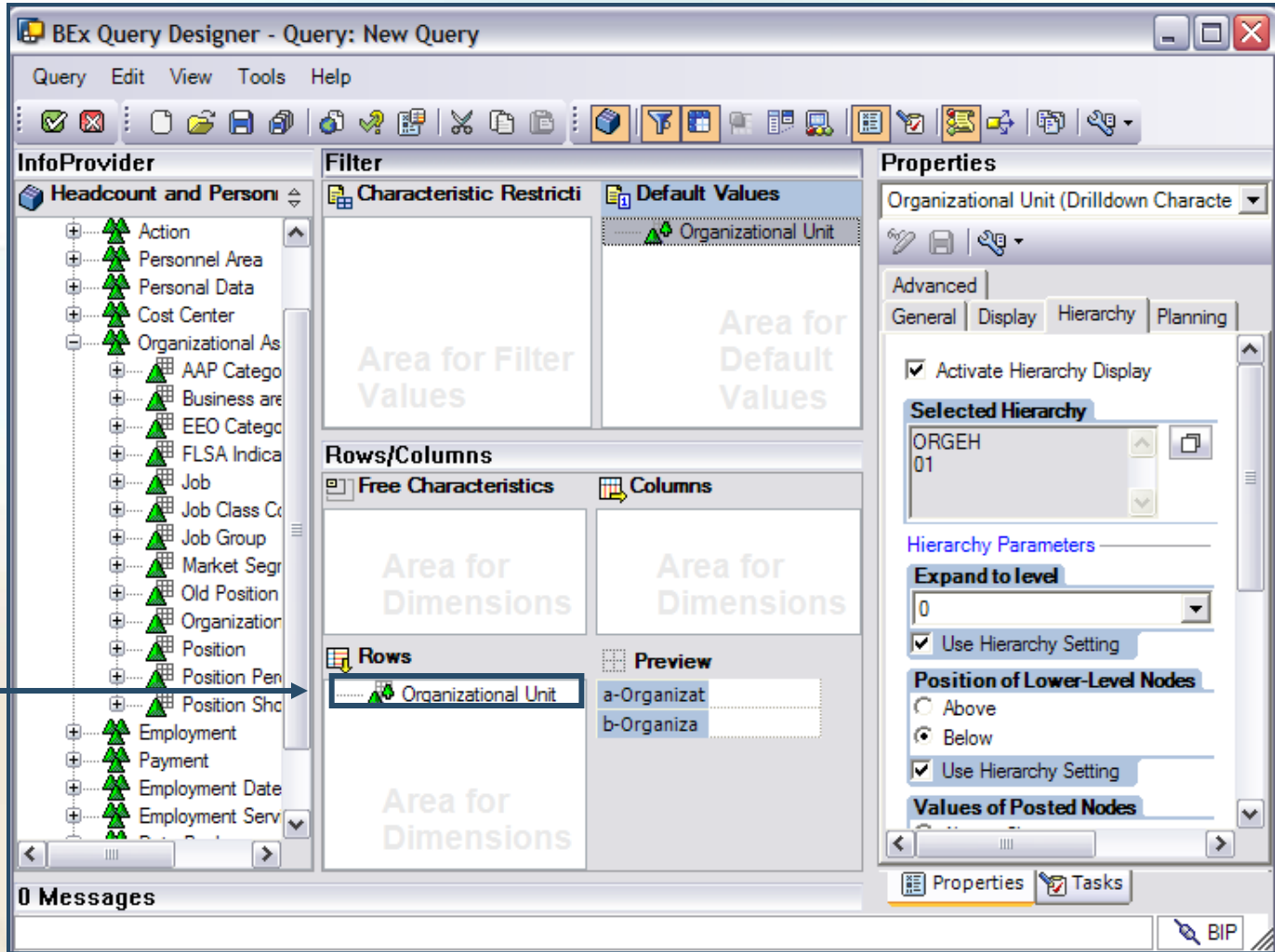


The screenshot shows the 'Select Hierarchy' dialog box. The 'Hierarchy Name' dropdown is set to 'Organizational plan'. The 'Hierarchy Version' dropdown is set to '01'. The 'Hierarchy Date' dropdown is set to '11/21/2008'. The 'OK' button is highlighted with a blue box, and an arrow points to it from the instruction 'Click OK.'.

Result: The Organizational Unit Characteristic has been changed to Organizational Unit Hierarchy.

# Hierarchy Characteristics, Cont...

Result: The Organizational Unit Characteristic has been changed to Organizational Unit Hierarchy.



# Hierarchy Characteristic Properties

The **Hierarchy Characteristic Properties** become available when a Hierarchy. The Display Hierarchy section becomes enabled.

The example below provides a brief description of the Display Hierarchy property settings (other property settings are defined in the Characteristics Properties section):

**Properties**  
Organizational Unit (Drilldown Characteristic)

General | Display | **Hierarchy** | Planning | Advanced

☒ Activate Hierarchy Display

**Selected Hierarchy**  
ORGEH  
01

**Hierarchy Parameters**  
**Expand to level**  
0

☒ Use Hierarchy Setting

**Position of Lower-Level Nodes**  
☐ Above  
☒ Below

☒ Use Hierarchy Setting

**Values of Posted Nodes**  
☒ Always Show  
☐ Hide

☒ Use Hierarchy Setting

**Nodes with Only One Lower-Level Node**  
☒ Always Show  
☐ Hide

☒ Use Hierarchy Setting

**Sorting**  
Sort by  
As in the Hierarchy

Sort Direction  
Ascending

☒ Use Characteristic Setting

Annotations:

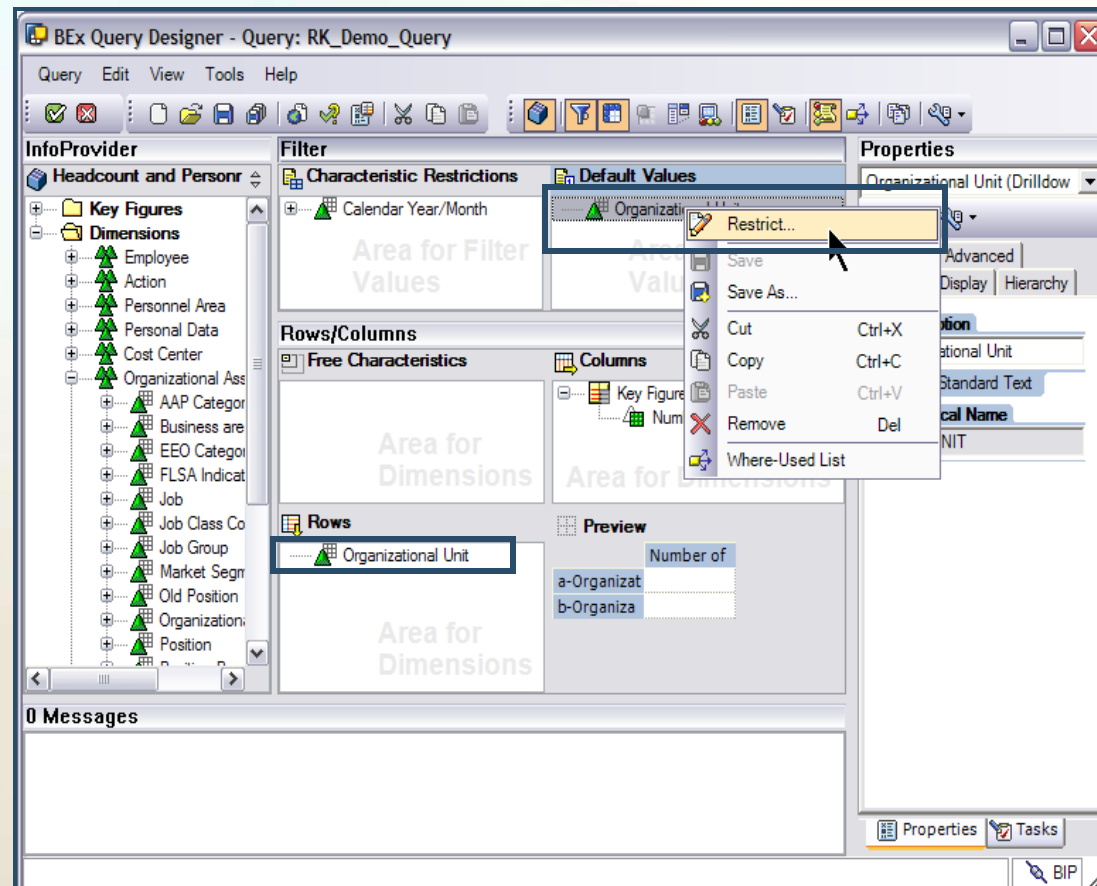
- Set the Hierarchy to Active (points to ☒ Activate Hierarchy Display)
- Select the Hierarchy (points to the Selected Hierarchy list)
- Specify how many levels the Hierarchy should expand to on execution (Expand to level 1 to rollup Hierarchy on startup) (points to Expand to level 0)
- Sort the Hierarchy: Ascending / Descending (points to Sort by As in the Hierarchy)

**Hierarchy Variables** are Variables added to a Hierarchy Characteristic that prompt the user to enter a Hierarchy Variable prior to running a query. The Organizational Unit Hierarchy is the only Hierarchy available in BI Release 1.

The example below uses the Headcount and Personnel Actions InfoProvider to show how to add the Organizational Unit Hierarchy Variable to the Organizational Unit Hierarchy. This will prompt the user to enter an Organizational Unit Hierarchy prior to running a query.

To add a Hierarchy Variable to a Hierarchy:

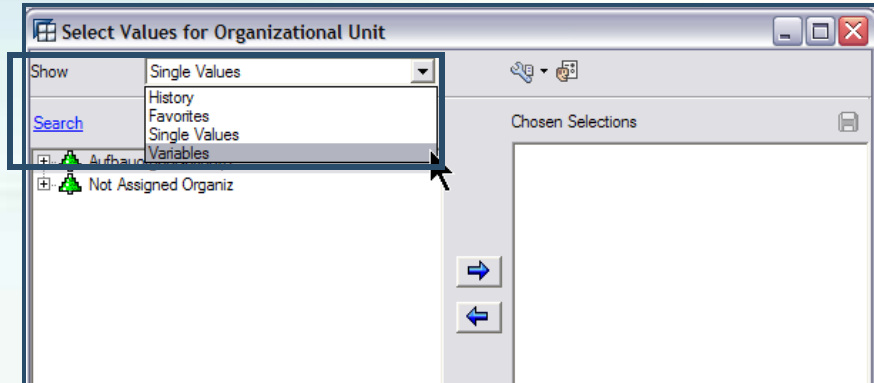
1. Drag&Drop the Organizational Unit Characteristic to the Rows section of the query.
2. Right click on the Organizational Unit Characteristic in the Default Values section to open the Context Menu.
3. Select Restrict.



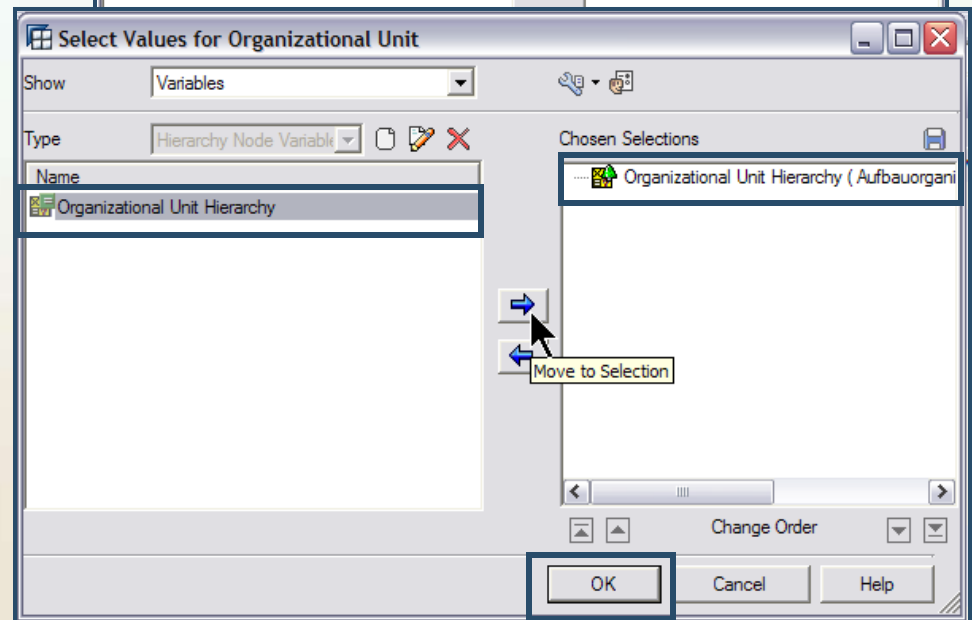


Result: The Selection Values for Organizational Unit screen will be displayed.

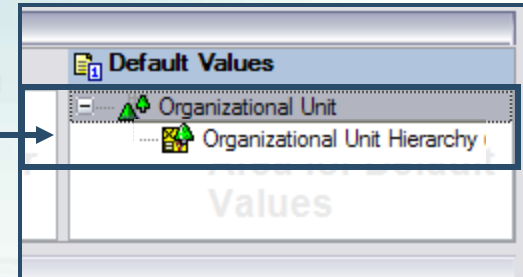
4. From the “Show” dropdown, select “Variables”.



5. Select “Organizational Unit Hierarchy”.
6. Click the arrow to “Move to Selection”.
7. Click OK.



Result: The Organizational Unit Hierarchy variable has been added to the Organizational Unit Characteristic



The user will be prompted to enter an Organizational Unit Hierarchy variable prior to running the ad hoc query.

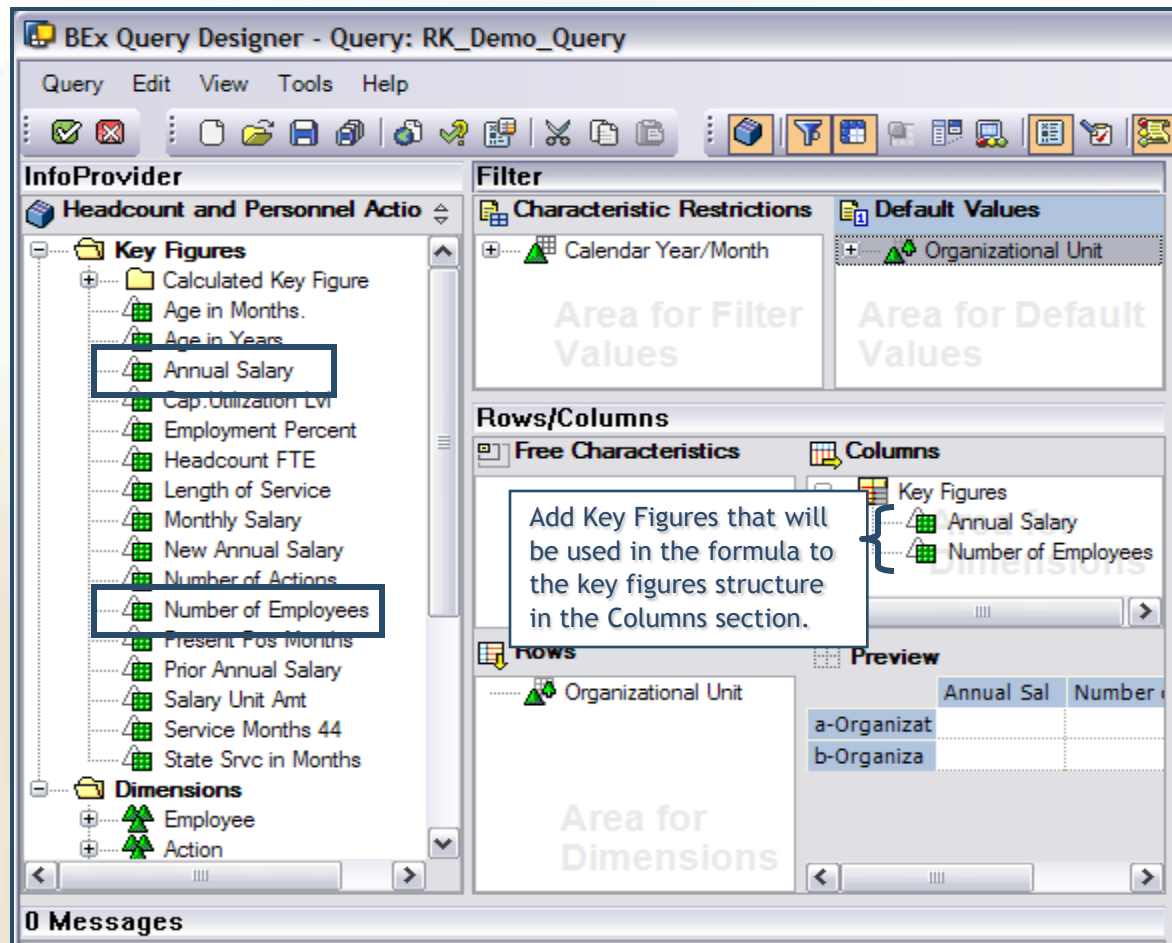
**Variable Entry**

Available Variants:     [Show Variable Personalization](#)

General Variables		
Variable	Current Selection	Description
Personnel Area - Select (Optional)		
Organizational Unit Hierarchy	+30000491(0ORGUNIT)	111

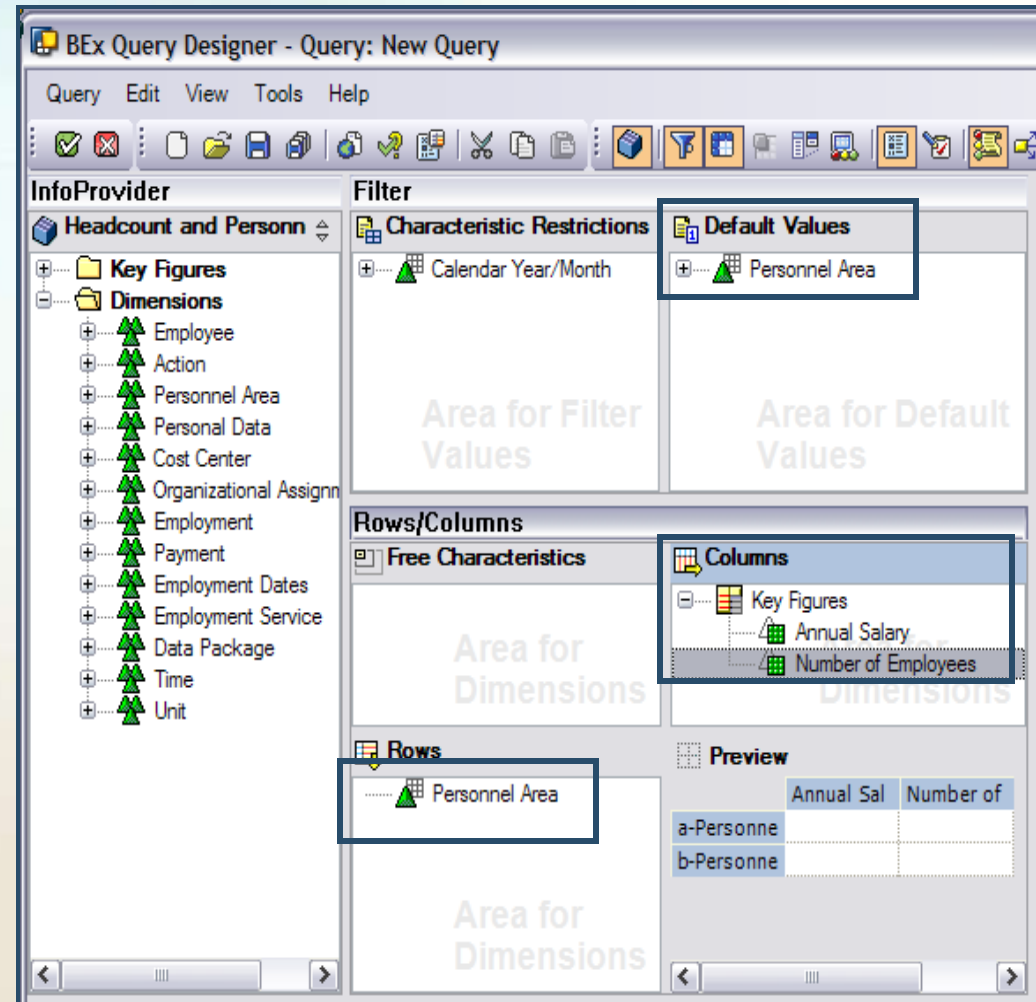
**Formulas** are calculations used to create custom Key Figures in the ad hoc query. Formulas use existing Key Figures to calculate a new Key Figure.

Key Figures that are used in a formula must be added to the Key Figures structure. For example, to create a basic formula that calculates the Average Annual Salary of employees, the Number of Employees and Annual Salary Key Figures must be added to the Key Figures structure of the query.



The example below uses the Headcount InfoProvider to show how to create a formula that will calculate the average salary of employees in a Personnel Area:

1. Drag&Drop the Annual Salary Key Figure to the Columns section of the query.
2. Drag&Drop the Number of Employees Key Figure to the Columns section of the query.
3. Drag&Drop the Personnel Area Characteristic to the Rows section.
4. Add the “Personnel Area (Optional)” Variable from the Personnel Area Characteristics Value Variables to the Default Values section.

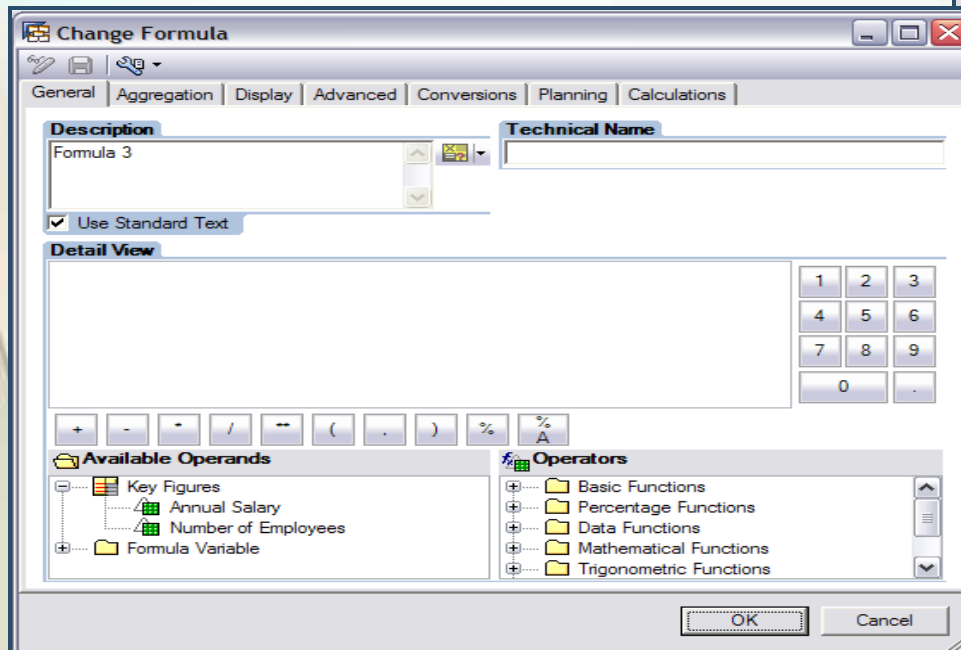
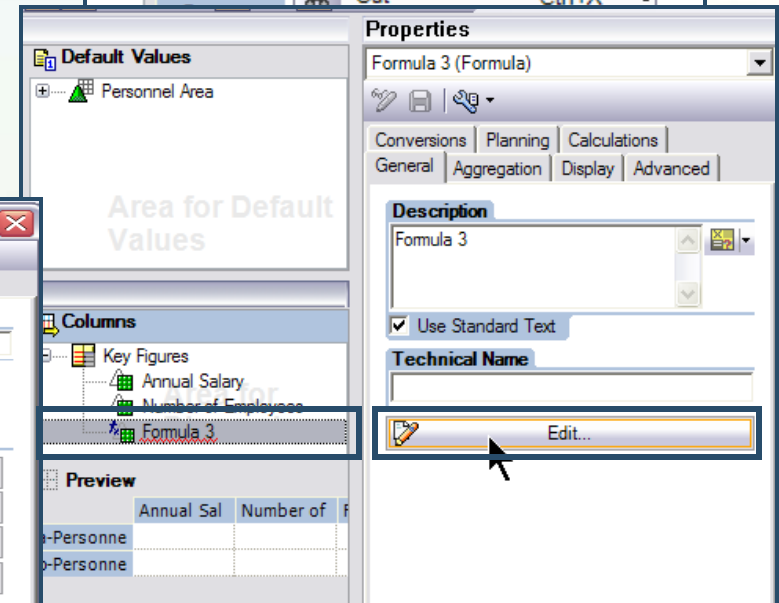
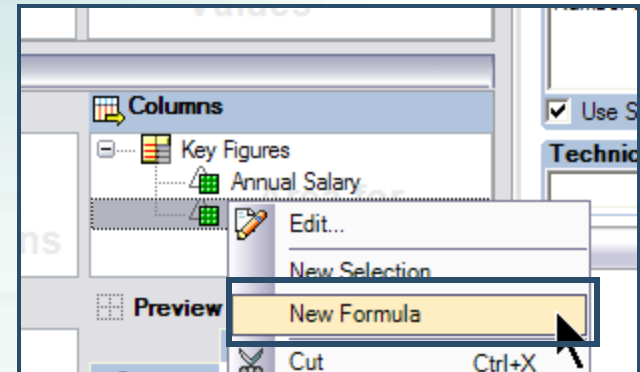




5. Right mouse-click the any object in the Columns section to open the Context Menu.
6. Select New Formula.

Result: The New Formula is added to the Column section.

7. Select the New Formula and click “Edit” in the Properties pane.
8. The “Change Formula” box is displayed.



10. Enter a description for the formula (in this example, "Average Salary") in the description field.
11. Double click Annual Salary key figure to add it to the formula..
12. Click the Divide by symbol.
13. Double click the Number of Employees key figure to add it to the formula
14. Click OK to close the Change Formula screen

**Change Formula**

General | Aggregation | Display | Advanced | Conversions | Planning | Calculations

**Description**  
Average Salary

**Technical Name**

☐ Use Standard Text

**Detail View**  
'Annual Salary' / 'Number of Employees'

**Available Operands**

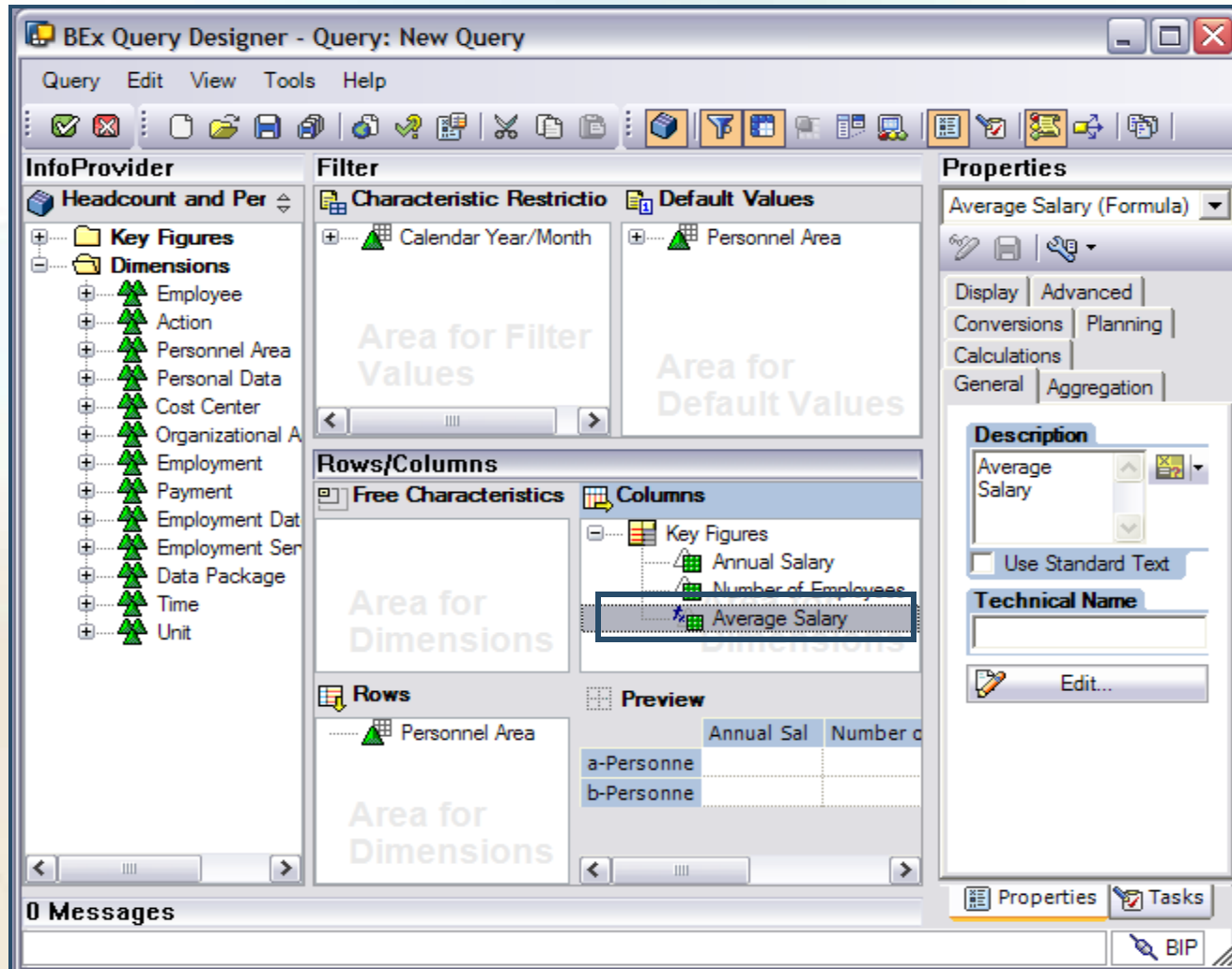
- Key Figures
  - Annual Salary
  - Number of Employees
- Formula Variable

**Operators**

- Basic Functions
- Percentage Functions
- Data Functions
- Mathematical Functions
- Trigonometric Functions
- Boolean Operators

**OK** **Cancel**

Result: A new key figure has been added to the ad hoc query that will calculate the Average Salary of employees by Personnel Area:



**Date Characteristics** are InfoObjects that can be added to a query from the Time dimension. Date Characteristics such as Calendar Days or Calendar Month/Year can be added to a query in Rows, Columns, Free Characteristics or Filters. If added to the Filters section, they will not be displayed in the query results.

When a Date Characteristic is used with a variable, Characteristics and Attributes in the query could report two different time periods (see *Key Date* for more information):

- Characteristics in the query will be “as of” the date value input by the user.
- Attributes in the query will be “as of” the Key Date set in the query properties.

The screenshot shows the BEx Query Designer interface with a new query. The 'Filter' pane contains 'Characteristic Restriction' and 'Default Values'. The 'Properties' pane shows 'Calendar Year/Month'. A dialog box 'Select Values for Calendar Year/Month' is open, showing a list of variables. The 'Calendar Month Prompt \_ Single Value' variable is selected. A callout box points to this variable with the text 'Date Variable: Calendar Month Prompt - Single Value'. Another callout box points to the 'Calendar Month Prompt \_ Single Value' variable in the 'Chosen Selection' list with the text 'Result: Prompt user for a Calendar Month/Year before running ad hoc query'. The 'Variable Entry' dialog box is also shown, displaying the 'Available Variables' list and the 'General Variables' table.

**Variable Entry**

Available Variables:  Save Save As... Delete [Show Variable Personalization](#)

General Variables		
Variable	Current Selection	Description
* Calendar Month Prompt _ Single Value		
Personnel Area - Select (Optional)		

OK Check



The **Key Date** represents the “as of” date for Attributes. Key Date is set from the Query Property settings of an ad hoc query.

Attributes and Characteristics in the query could report two different time periods when a Date Characteristic (see *Ad Hoc Query Dates* for more information) is used with a variable.

- Attributes in the query will be “as of” the Key Date set in the query properties.
- Characteristics in the query will be “as of” the date value input by the user.

**BEx Query Designer - Query: RK\_Test\_Query\_BI**

Query Edit View Tools Help

**InfoProvider**  
Headcount and Personnel Ac

**Filter**  
Characteristic Restrictions  
Calendar Year/Month  
Calendar Month Prompt \_ Single Value

**Default Values**  
Personnel Area  
Employee

**Area for Default Values**

**Area for Filter Values**

**Area for Dimensions**

**Free Characteristics**  
Personnel Area  
Employee  
Hire Date  
Position  
Annual Salary

**Columns**  
a-Personne a-Employe  
b-Personne b-Employe

**Preview**

**Properties**  
RK\_Test\_Query\_BI (Query)

Rows/Columns Value Display  
Planning Advanced  
General Variable Sequence Display

**Description**  
RK\_Test\_Query\_BI

**Technical Name**  
ARK\_TEST\_QUERY\_BI

**InfoProvider**  
ZPA\_C01

**Key Date**  
[Field with formula: &ZZKYDATE&]  
Use Standard Date

**Key Date**  
[Field with formula: &ZZKYDATE&]  
Use Standard Date

Key Date Property  
(if empty, defaults to current date)

Date/Time: 6/9/2008 12:56:01 PM

The example below shows InfoObjects of an ad hoc query that are related to Key Date.

- Attributes in the query results will report the date values as of the Key Date in the ad hoc query Properties. If the Key Date is not set, the date will be as of the current date.
- If a Date Variable is added to a Date Characteristic in the query, Characteristics in the query results will report the date values input by the user from the Date Variable.

**BEx Query Designer - Query: RK\_Test\_Query\_BI**

Query Edit View Tools Help

**InfoProvider**

- Personnel Area
  - Personal Data
  - Cost Center
  - Organizational Assignment
  - Employment
  - Payment
  - Employment Dates
    - Anniversary Date
    - Appointment Date
    - Hire Date
    - Next Increase Dt
    - Seniority Date
    - Service Date
  - Employment Service
  - Data Package
  - Time
  - Unit

**Filter**

Characteristic Restrictions

- Calendar Year/Month
  - Calendar Month Prompt \_ Single Value

**Default Values**

Area for Filter Values

**Rows/Columns**

Free Characteristics

Columns

**Rows**

- Personnel Area
  - Employee
    - Hire Date
    - Position
    - Annual Salary

**Preview**

Area for Dimensions

0 Messages

**Annotations:**

- Calendar Year/Month Characteristic
- Date Variable (prompt user for month/year prior to running query)
- Characteristics: Valid as of the Calendar Year/Month input by the user.
- \*Attribute: Valid as of the Key Date



\*Attributes can be identified by the Technical Name: An Attribute includes the Characteristic Technical Name, followed by an underscore (\_) and the Attribute Technical Name

To ensure Attributes and Characteristics report the same time periods in the query results, the following options are available:

1. **Do not use a Date Variable**

If a Date Variable is not added to an ad hoc query, the Attributes and Characteristics will be valid as of the current date. The Key Date does not need to be set since it defaults to the current date.

2. **Manually set Key Date**

The Key Date can be manually set from the Query Property settings. If the Key Date is manually set, the value from the Key Date in the Query Property settings will be used each time the query is run.

If a variable value is input at query runtime:

- the value from the Key Date in the Query Property settings will be used for Attributes.
- the value from the variable will be used for Characteristics.

The following page will show two examples of manually setting the Key Date using a Calendar Year/Month variable and a Calendar Day variable.

Continued...

The following example uses the “Calendar Month Prompt - Single Value” variable to show how the Key Date could be set if the calendar month is set to 4/2008:

Variable Entry

Available Variables:  Save Save As... Delete Show Variable Personalization

Variable	Current Selection	Description
* Calendar Month Prompt - Single Value	4/2008	
Personnel Area - Select (Optional)		

OK Check

Example: Calendar Month Prompt - Single Value variable for 4/2008

User sets variable value at runtime

Properties

RK\_Test\_Query\_BI (Query)

Rows/Columns | Value Display | Planning | Advanced | General | Variable Sequence | Display

Description  
RK\_Test\_Query\_BI

Technical Name  
ARK\_TEST\_QUERY\_BI

InfoProvider  
ZPA\_C01

Key Date  
4/30/2008

Use Standard Date

Example: Set Key Date property to the last day of the month selected from the Variables prompt - 7/2005

The following example uses the “Calendar Day” variable to show how the Key Date could be set if the calendar month is set to 6/2008:

Variable Entry

Available Variables:  Save Save As... Delete Show Variable Personalization

Variable	Current Selection	Description
Personnel Area - Select (Optional)		
Calendar Day	06/09/2008	06/09/2008

OK Check

Example: 0CALDAY (OPTIONAL) variable for 6/9/2008

User sets variable value at runtime

Properties

RK\_Test\_Query\_BI (Query)

Rows/Columns | Value Display | Planning | Advanced | General | Variable Sequence | Display

Description  
RK\_Test\_Query\_BI

Technical Name  
ARK\_TEST\_QUERY\_BI

InfoProvider  
ZPA\_C01

Key Date  
06/09/2008

Use Standard Date

Example: Set Key Date property to the same day of the day selected from the Variables prompt - 7/16/2005



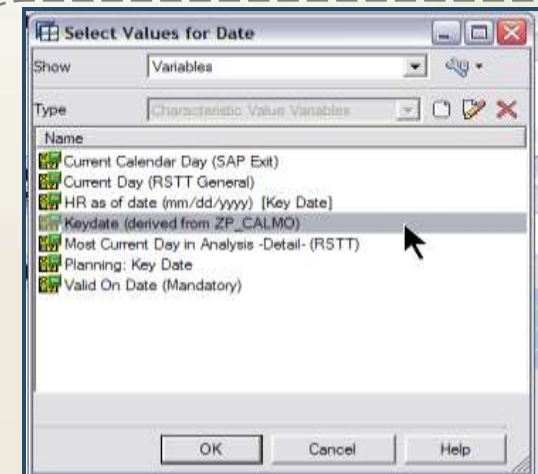
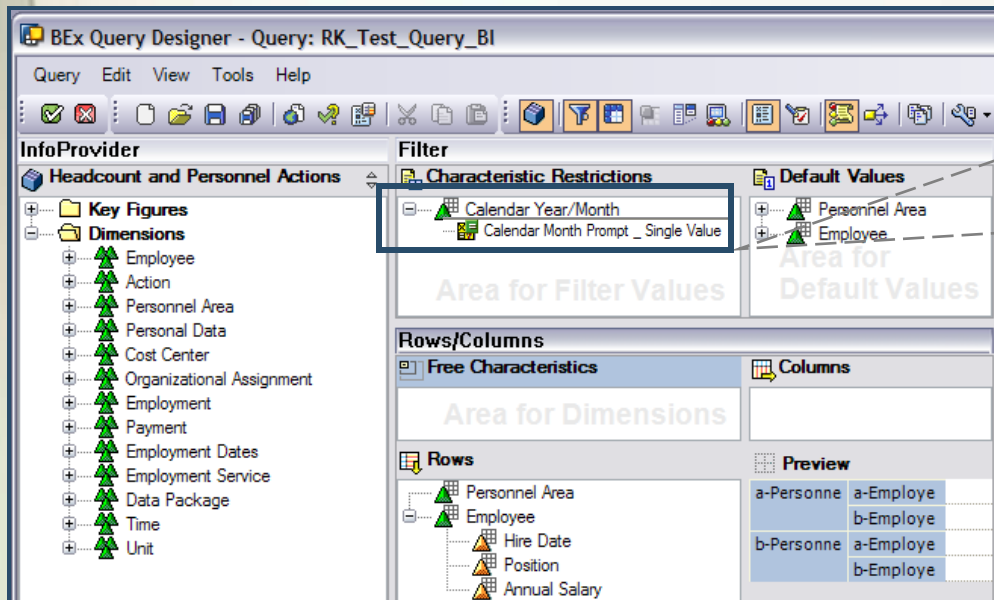
### 3. Use the Key Date Variable for a Single Month/Year

The Key Date can be set using the variable “Key Date for ZP\_CALMO”. This will ensure that the Attributes and Characteristics are reporting on the same time period without having to manually set the Key Date.

The “Key Date for ZP\_CALMO” variable is used with the “Calendar Month Prompt - Single Value” (ZP\_CALMO) variable. The “Calendar Month Prompt - Single Value” variable prompts users to enter a month/year value at query runtime.


If a variable value is input at query runtime:

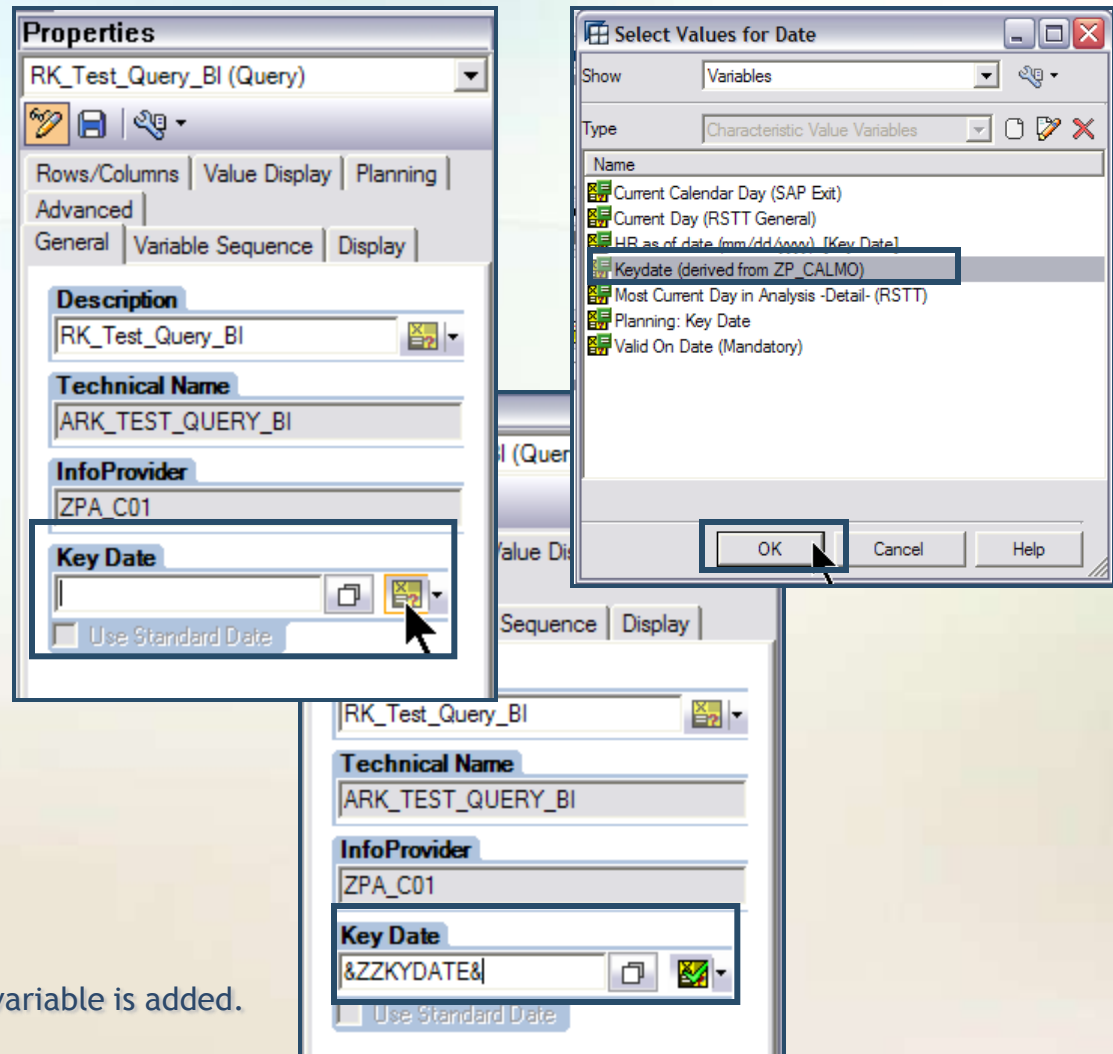
- the value from the “Key Date for ZP\_CALMO” variable for Key Date in the Query Property settings will be used for Attributes.
- the value from the “Calendar Month Prompt - Single Value” variable will be used for Characteristics.



Continued...

To set the Key Date property to the “Key Date for ZP\_CALMO” variable:

1. In the Properties box for the Query, click the variable  icon in the Key Date section.
2. In the Select values for Date, select “Keydate”.
3. Click OK.



Result: Key Date variable is added.